D2 (concluded)

(d) electrically or electronically functionalizing the at least one nucleotide fiber by depositing thereon or complexing thereto at least one substance or particles.

D3

31 ~~32~~. (Amended) A method according to claim ~~28~~ 27, wherein said functionalization is achieved by forming on said nucleotide fiber at least one nucleation center from which said substance or particles are grown.

REMARKS

Claims 1-17 and 19-32 are pending. By the Office Action, claims 1-17 and 19-32 are rejected. By this Amendment, claims 28 and 32 are amended. No new matter is added.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

I. SPECIFICATION AND CLAIM AMENDMENTS

The specification is amended to correct a typographical error.

Support for the amendment to claim 28 can be found in the original claims. The amendment to claim 28 is not a narrowing amendment, and merely makes explicit that which was implicit.

Claim 32 is amended to correct a typographical error. The amendment to claim 32 is not a narrowing amendment.

II. §102/103 REJECTIONS

Claims 1-17 and 19-32 are rejected under 35 U.S.C. §102(b) as being anticipated by, or under 35 U.S.C. §103(a) as being obvious over, U.S. Patent No. 5,561,071 to Hollenberg et al. (Hollenberg). Applicants respectfully traverse the rejection.

A. Claims 1-17 and 19-27

Claim 1 is directed to an electric network comprising at least one nucleotide fiber defining the network's geometry, and one or more substances bound to the nucleotide fiber continuously along said fiber to form at least one electric or electronic component or a

D

conductor. Hollenberg does not teach or suggest at least the following feature of claim 1: at least one nucleotide defining the network's geometry.

As can be seen at least in Fig. 3A/2 of the present specification, the nucleotide fiber determines the positioning of the conductive particles in the claimed electric network. Thus, the conduction of electricity through the conductive substances is controlled by the geometry of the nucleotide fiber. In this way, the nucleotide fiber defines the entire network's geometry.

In contrast to claim 1, Hollenberg discloses a network in which a first conductive substance C is deposited along a nucleic acid pattern. Preferably, the DNA is then removed. Alternatively, the DNA is not removed and a second conductive substance D is coated over the entire surface defined by the substrate, i.e., each of the first conductive surface C, the DNA and the substrate A. The positioning of the conducting substance D is not determined by the DNA. See at least column 8, line 62 to column 9, line 30, and Fig. 1. Conduction can occur along any geometry throughout the network, and is not limited to a geometry determined by the DNA.

In addition, conductive substance D masks conductive substance C; therefore, even if Hollenberg's network were connected to an electronic interface, the electric current would pass through conductive substance D and conductive substance C without distinguishing between the two substances. The DNA in Hollenberg's network therefore has no bearing on the network's geometry (i.e., electric geometry). It is clear from step (5) in Fig. 1 and at column 9, lines 24-25, that conductive substance D is necessary for Hollenberg's network to function. Step (5) indicates that substrate A could be replaced by another substrate, such as substrate E. For this to be possible, conductive substance D must be present, coated over the entire surface defined by the substrate, in order to maintain the integrity of the network while substrate A is replaced.

For at least these reasons, Applicants submit that Hollenberg does not teach or suggest every feature of claim 1. Thus, claim 1 is not anticipated by, and would not have been obvious over, Hollenberg. Claims 2-17 and 19-27 ultimately depend from claim 1, and thus include all of its limitations. Accordingly, these dependent claims are not anticipated by, and would not have been obvious over, Hollenberg for at least the same reasons as claim 1, as well as for their own reasons.

B. Claims 28-32

Claim 28 is directed to a method for making an electronic network comprising contacting the claimed arrangement with at least one nucleotide fiber, defining the network's geometry, and electrically or electronically functionalizing the at least one nucleotide fiber by depositing thereon or complexing thereto at least one substance or particles. As discussed above, Hollenberg does not teach or suggest at least one nucleotide fiber defining a network's geometry, as claimed.

In addition, the at least one nucleotide fiber in claim 28 is contacted to an electronic arrangement, and the conductive substances are deposited on/complexed to the at least one nucleotide fiber. The conductive substances are thus limited to the geometry defined by the nucleotide fiber, and it is these conductive substances that are contacted to the arrangement.

If Hollenberg's network was contacted to an arrangement, conductive substance D, which is not limited to the geometry defined by the nucleotide fiber, is the only conductive substance capable of contacting the arrangement. In contrast to claim 28, the conduction of electricity through the conductive substance D is not controlled by the geometry of the nucleotide fiber Accordingly, Hollenberg does not teach or suggest electrically or electronically functionalizing at least one nucleotide fiber by depositing thereon or complexing thereto at least one substance or particles, as required by claim 28. In fact, the

D

DNA of Hollenberg's network is not electrically or electronically functionalized, as required by claim 28.

For at least these reasons, Applicants submit that Hollenberg does not teach or suggest every feature of claim 28. Thus, claim 28 is not anticipated by, and would not have been obvious over, Hollenberg. Claims 29-32 ultimately depend from claim 28, and thus include all of its limitations. Accordingly, these dependent claims are not anticipated by, and would not have been obvious over, Hollenberg for at least the same reasons as claim 28, as well as for their own reasons.

C. Conclusion

For at least the reasons discussed above, claims 1-17 and 19-32 not anticipated by, and would not have been obvious over, Hollenberg. Reconsideration and withdrawal of the rejection are respectfully requested.

III. §112 REJECTION

Claims 1-17 and 19-32 are rejected under the enablement requirement of 35 U.S.C. §112, first paragraph. In particular, the Office Action indicates there is no enablement for p-n junction devices in the absence of a working example. Applicants respectfully traverse the rejection.

A. Claims 1-16, 19 and 21-32

None of claims 1-16, 19 and 21-32 are limited to p-n junctions, and none of these claims specifically recite such language. As agreed to in the September 17 telephone conference with Examiner Jackson, the rejection of claims 1-16, 19 and 21-32 is improper and should be withdrawn.

MPEP §2164.02 explicitly states that compliance with the enablement requirement of 35 U.S.C. 112, first paragraph, does not turn on whether an example is disclosed. An example may be "working" or "prophetic." A prophetic example describes an embodiment of

the invention based on predicted results rather than work actually conducted or results actually achieved. Claims 17 and 20 are enabled by the specification in the absence of working examples for the reasons discussed below.

B. Claim 17

Claim 17 is directed to a network wherein one of two adjacent portions of at least one nucleotide fiber are bound to a p-type semi-conducting substance and the other to an n-type semi-conducting substance, whereby the two adjacent portions of the nucleotide fiber constitute a p-n junction.

At page 28, line 10 - page 30, line 18 of the present specification, Applicants disclose how to make a network in which an n/p diode can be made according to the invention. One of ordinary skill in the art would be able, using known techniques, to first bind an n-type substance to a first oligonucleotide, and then bind a p-type substance to a second oligonucleotide complementary to the first oligonucleotide. Further, one of ordinary skill in the art would be able to hybridize the complementary DNA nucleotides to one another using known and predictable hybridization techniques. thereby bringing the p-type and n-type substances together, thus forming an p-n junction. Accordingly, one of ordinary skill in the art would be able to make and use the invention of claim 17 based on the present specification and knowledge available to one of ordinary skill in the art.

For at least these reasons, claim 17 satisfies the enablement requirement of §112, first paragraph.

C. Claim 20

Claim 20 is directed to a network wherein a nucleotide junction is formed into bipolar transistors comprising a p-type semi-conducting substance bound to a first nucleotide fiber at the junction and an n-type semi-conducting substance bound to an adjacent, second nucleotide fiber at both sides of the first nucleotide fiber, or an n-type semi-conducting

substance bound to a first nucleotide fiber at the junction and a p-type semi-conducting substance bound to an adjacent, second nucleotide fiber at both sides of the first nucleotide fiber.

At page 28, line 10 - page 30, line 18 of the present specification, Applicants disclose forming a nucleotide junction into bipolar transistors. As discussed above, one of ordinary skill in the art would be able to bind a p-type substance to a first nucleotide, an n-type substance to a second nucleotide, a p-type substance to a third nucleotide, and hybridize the nucleotides together, using known and predictable techniques. The resulting product can then be connected to electrodes, thus forming a pnp bipolar transistor. Accordingly, one of ordinary skill in the art would be able to make and use the invention of claim 20 based on the present specification and knowledge available to one of ordinary skill in the art.

For at least these reasons, claim 20 satisfies the enablement requirement of §112, first paragraph.

D. Conclusion

For at least the reasons discussed above, and in view of MPEP §2164.02, claims 17 and 20 each satisfy the enablement requirement of §112, first paragraph. Reconsideration and withdrawal of the rejection are respectfully requested.

IV. CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-17 and 19-32 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Philip A. Caramanica
Registration No. 51,528

JAO:PAC/da

Attachment:
Appendix

Date: December 24, 2002

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

D

APPENDIX

Changes to Specification:

Page 2, line 30:

~~Hellenberg~~Hollenberg, *et al.*, U.S. Patent 5,561,071.

Changes to Claims:

The following is a marked-up version of the amended claims:

28. (Twice Amended) A method for making an electronic network, comprising:

(a) providing an arrangement comprising at least one electrically conductive interface component;

(b) attaching a linker to the at least one interface component;

(c) contacting said arrangement with at least one nucleotide fiber, defining the network's geometry, with a sequence capable of binding to the linker, and permitting binding of said sequences to said linker,

(d) electrically or electronically functionalizing the at least one nucleotide fiber by depositing thereon or complexing thereto at least one substance or particles.

32. (Amended) A method according to claim ~~12~~28, wherein said functionalization is achieved by forming on said nucleotide fiber at least one nucleation center from which said substance or particles are grown.

D